


PHIL 255
Week 6: Machines
 Paul Thagard


Please turn off and
 put away all
 electronics.

Please avoid the last
 2 rows.


Machine intelligence
 Functionalism



1




Machine Intelligence




Successes:


- Google driverless car, translation
- IBM Watson
- Robot scientist
- Mars rover
- Spaun




2



Approaches to MI




- Symbolic reasoning: logic, rules, case-based reasoning
- Neural networks (connectionism)
- Statistical
 - Bayes networks
 - Machine learning
- Synthesis: EliaSmith's semantic pointer hypothesis



3

Turing Test



Turing Test (1950): use a text-based interface to see if people can tell the difference between communication with a computer and a human.

Not sufficient: people can be tricked, e.g. by Eliza.

Not necessary: a computer might be found out it even though it is many respects more intelligent than people.

4

For MI (AI)

Computers are getting faster with more powerful memories.

Successes: cars, Watson, etc.

Advances in neuromorphic computing

Silicon chip replacement thought experiment

5

Against MI

Progress has been slow and disappointing.

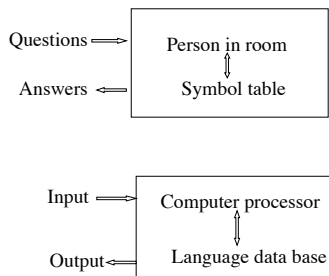
Computers will never be capable of consciousness, emotions, free will, etc.

Searle's Chinese room argument.

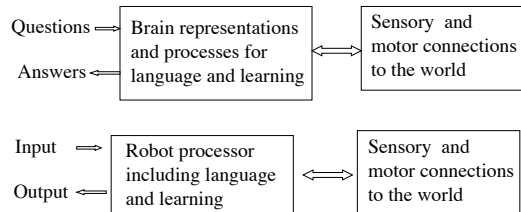
Ethics: vs. machine domination.

6

Searle's Chinese Room



7



8

Responses to Searle

The person in the room would not produce natural language.

The analogy only applies to the simplest computers.

A robot with the capacity to interact with the world and learn from its experience would have meaning and intentionality.

9

Discussion Question

So you think computers will ever be as intelligent as humans?

10

Functionalism



Mental states are not defined by a special substance (dualism) or physical constituents (mind-brain identity).

Mental states are defined by functional causal relations to sensory inputs, behavioral outputs, and other mental states.

Main argument for functionalism: multiple realizability of mental states in non-human brains, computers, etc.

11

Against Functionalism

Option: restricted mind-brain identity theory: human mental states are brain states.

Dualist arguments: zombie, etc.

Materialist arguments:

The more we learn about the brain, the more we realize that physical structure matters: brain organization, neurotransmitters, glial cells, etc.

Computers might have consciousness, but it would be very different from human experience.

12